

**FR-N-3SM-01-xxF1 Series**

HYBRIFLEX® RRH Optical Fiber Cable, 3 Pair, Ruggedized Bend-Insensitive Single-Mode Fiber, DLC to DLC/FullAXS Compatible Connectors

**PRODUCT DESCRIPTION**

RFS' HYBRIFLEX Remote Radio Head (RRH) hybrid feeder cabling solution combines any combination of optical fiber and/or DC power for RRHs in a single lightweight armored or unarmored cable, making it the world's most innovative solution for RRH deployments. Hybrid, Fiber Optic and DC riser trunk and jumper cables are available in a large variety of fiber counts, DC counts and cross sections. Both pre-connectorized and on-site options are available.

**FEATURES / BENEFITS**

- Ruggedized, bend-insensitive fiber design with outstanding bending characteristics
- Lightweight solution and compact design – Decreases tower loading
- Robust cabling – Eliminates need for expensive cable trays and ducts
- Installation of tight bundled fiber optic cable pair directly to the RRH – Reduces CAPEX and wind load by eliminating need for interconnection
- Outdoor, black jacket – Ensures long-lasting cable protection
- **100% Factory tested - Online test results available**

**TECHNICAL FEATURES****STRUCTURE**

|                  |  |                 |
|------------------|--|-----------------|
| Cable Type       |  | HYBRIFLEX®      |
| Fire Performance |  | Flame Retardant |

**MECHANICAL SPECIFICATIONS**

|                                        |              |                    |
|----------------------------------------|--------------|--------------------|
| Outer Diameter Nominal                 | mm (in)      | 5.5 (0.217)        |
| Cable Weight                           | kg/m (lb/ft) | 0.033 (0.022)      |
| Minimum Bending Radius, Single Bend    | mm (in)      | 66 (2.6)           |
| Minimum Bending Radius, Multiple Bends | mm (in)      | 83 (3.3)           |
| Recommended / Maximum Clamp Spacing    | m (ft)       | 1 / 1.2 (3.25 / 4) |

**F/O CABLE SPECIFICATIONS**

|                                  |         |                                                               |
|----------------------------------|---------|---------------------------------------------------------------|
| Number of F/O Pairs              |         | 3                                                             |
| F/O Cable Type                   |         | G657-A2 Single Mode, Bend Tolerant                            |
| Core/Clad                        | µm      | 9/125                                                         |
| Secondary Protection Nominal     | µm (in) | 900 (0.035)                                                   |
| F/O Standards (Meets or Exceeds) |         | UL Listed Type OFNR (UL1666), RoHS Compliant                  |
| Optical Loss                     | dB/Km   | 0.5 @ 1310 nm<br>0.5 @ 1550 nm                                |
| FO Break-out Length (Top)        | mm (in) | 279 (11)                                                      |
| FO Break-out Length (Bottom)     | mm (in) | 228 (9)                                                       |
| Cable Sealing Method             |         | Semi-rigid flame-retardant polyolefin, with hot melt adhesive |

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|                         |  |                                          |
|-------------------------|--|------------------------------------------|
| Fiber Termination End 1 |  | DLC Connector                            |
| Fiber Termination End 2 |  | DLC Connector with FullAXS Compatibility |

**CABLE JACKET**

|                                              |  |                                             |
|----------------------------------------------|--|---------------------------------------------|
| UV-Protection Individual and External Jacket |  | Yes                                         |
| Jacket Material                              |  | Flame Retardant, Indoor/Outdoor, PVC, Black |

**TESTING AND ENVIRONMENTAL**

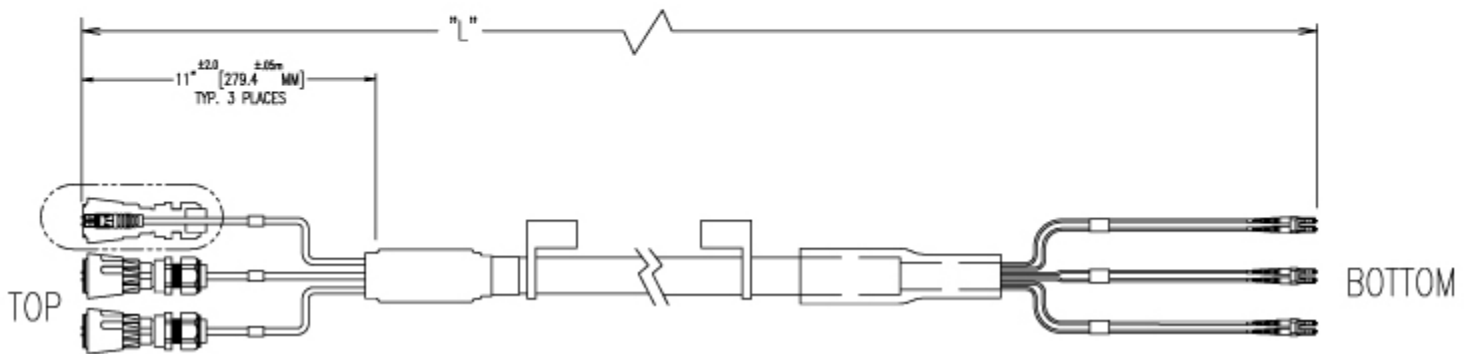
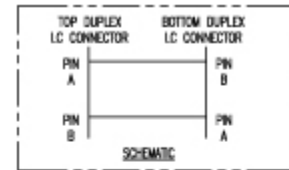
|                          |         |                        |
|--------------------------|---------|------------------------|
| Storage Temperature      | °C (°F) | -40 to 70 (-40 to 158) |
| Operation Temperature    | °C (°F) | -40 to 65 (-40 to 149) |
| Installation Temperature | °C (°F) | -20 to 65 (-4 to 149)  |
| Jacket Specifications    |         | UL 1666                |

**EXTERNAL DOCUMENT LINKS**

Installation Guidelines: [Download](#)

QuickShip 2.0 Program Information: [Download](#)

On-line Factory Test Results: [View](#)

**NOTES**

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**ADDITIONAL ASSEMBLIES - 1 PAIR SM FIBER**

| Length, ft | Model Number      |
|------------|-------------------|
| 10         | FR-N-1SM-01-10F1  |
| 20         | FR-N-1SM-01-20F1  |
| 30         | FR-N-1SM-01-30F1  |
| 40         | FR-N-1SM-01-40F1  |
| 50         | FR-N-1SM-01-50F1  |
| 60         | FR-N-1SM-01-60F1  |
| 79         | FR-N-1SM-01-70F1  |
| 80         | FR-N-1SM-01-80F1  |
| 90         | FR-N-1SM-01-90F1  |
| 100        | FR-N-1SM-01-100F1 |

**ADDITIONAL ASSEMBLIES - 2 PAIR SM FIBER**

| Length, ft | Model Number      |
|------------|-------------------|
| 10         | FR-N-2SM-01-10F1  |
| 20         | FR-N-2SM-01-20F1  |
| 30         | FR-N-2SM-01-30F1  |
| 40         | FR-N-2SM-01-40F1  |
| 50         | FR-N-2SM-01-50F1  |
| 60         | FR-N-2SM-01-60F1  |
| 70         | FR-N-2SM-01-70F1  |
| 80         | FR-N-2SM-01-80F1  |
| 90         | FR-N-2SM-01-90F1  |
| 100        | FR-N-2SM-01-100F1 |

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**ADDITIONAL ASSEMBLIES - 3 PAIR SM FIBER**

| Length, ft | Model Number      |
|------------|-------------------|
| 10         | FR-N-3SM-01-10F1  |
| 20         | FR-N-3SM-01-20F1  |
| 30         | FR-N-3SM-01-30F1  |
| 40         | FR-N-3SM-01-40F1  |
| 50         | FR-N-3SM-01-50F1  |
| 60         | FR-N-3SM-01-60F1  |
| 79         | FR-N-3SM-01-70F1  |
| 80         | FR-N-3SM-01-80F1  |
| 90         | FR-N-3SM-01-90F1  |
| 100        | FR-N-3SM-01-100F1 |

**ADDITIONAL ASSEMBLIES - 4 PAIR SM FIBER**

| Length, ft | Model Number      |
|------------|-------------------|
| 10         | FR-N-4SM-01-10F1  |
| 20         | FR-N-4SM-01-20F1  |
| 30         | FR-N-4SM-01-30F1  |
| 40         | FR-N-4SM-01-40F1  |
| 50         | FR-N-4SM-01-50F1  |
| 60         | FR-N-4SM-01-60F1  |
| 70         | FR-N-4SM-01-70F1  |
| 80         | FR-N-4SM-01-80F1  |
| 90         | FR-N-4SM-01-90F1  |
| 100        | FR-N-4SM-01-100F1 |

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**ADDITIONAL ASSEMBLIES - 1 STRAND SM FIBER**

| Length, ft | Model Number       |
|------------|--------------------|
| 10         | FR-N-1SSM-01-10F1  |
| 20         | FR-N-1SSM-01-20F1  |
| 30         | FR-N-1SSM-01-30F1  |
| 40         | FR-N-1SSM-01-40F1  |
| 50         | FR-N-1SSM-01-50F1  |
| 60         | FR-N-1SSM-01-60F1  |
| 70         | FR-N-1SSM-01-70F1  |
| 80         | FR-N-1SSM-01-80F1  |
| 90         | FR-N-1SSM-01-90F1  |
| 100        | FR-N-1SSM-01-100F1 |

**ADDITIONAL ASSEMBLIES - 2 STRAND SM FIBER**

| Length, ft | Model Number       |
|------------|--------------------|
| 10         | FR-N-2SSM-01-10F1  |
| 20         | FR-N-2SSM-01-20F1  |
| 30         | FR-N-2SSM-01-30F1  |
| 40         | FR-N-2SSM-01-40F1  |
| 50         | FR-N-2SSM-01-50F1  |
| 60         | FR-N-2SSM-01-60F1  |
| 70         | FR-N-2SSM-01-70F1  |
| 80         | FR-N-2SSM-01-80F1  |
| 90         | FR-N-2SSM-01-90F1  |
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**ADDITIONAL ASSEMBLIES - 3 STRAND SM FIBER**

| Length, ft | Model Number       |
|------------|--------------------|
| 10         | FR-N-3SSM-01-10F1  |
| 20         | FR-N-3SSM-01-20F1  |
| 30         | FR-N-3SSM-01-30F1  |
| 40         | FR-N-3SSM-01-40F1  |
| 50         | FR-N-3SSM-01-50F1  |
| 60         | FR-N-3SSM-01-60F1  |
| 70         | FR-N-3SSM-01-70F1  |
| 80         | FR-N-3SSM-01-80F1  |
| 90         | FR-N-3SSM-01-90F1  |
| 100        | FR-N-3SSM-01-100F1 |

**ADDITIONAL ASSEMBLIES - 4 STRAND SM FIBER**

| Length, ft | Model Number       |
|------------|--------------------|
| 10         | FR-N-4SSM-01-10F1  |
| 20         | FR-N-4SSM-01-20F1  |
| 30         | FR-N-4SSM-01-30F1  |
| 40         | FR-N-4SSM-01-40F1  |
| 50         | FR-N-4SSM-01-50F1  |
| 60         | FR-N-4SSM-01-60F1  |
| 70         | FR-N-4SSM-01-70F1  |
| 80         | FR-N-4SSM-01-80F1  |
| 90         | FR-N-4SSM-01-90F1  |
| 100        | FR-N-4SSM-01-100F1 |

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**PRE-PACKED HYBRIFLEX KITS FOR EASY INTEGRATION INTO RAYCAP JUNCTION BOXES**

RFS Technologies now offers Kitting options for most hybrid risers and jumpers that include both the cable assembly and the Raycap inserts. For reference, kits have a "K" as the third digit in the model number. HB158 does not require an additional gland/insert for proper installation and sealing into the Distribution Boxes.

| Kit Model Prefix | Assembly Prefix | Assembly Qty | Raycap Insert Kit           | Insert Kit Contents                                  | Raycap Insert Kit Qty |
|------------------|-----------------|--------------|-----------------------------|------------------------------------------------------|-----------------------|
| <b>HBK114</b>    | HB114           | 1            | RFS Technologies-TRUNK-KIT  | (2) 190 0620, Insert, M75, 1H, 40mm                  | 1                     |
| <b>HBK058</b>    | HBF058          |              | RFS Technologies-JUMP-KIT   | (1) 190 0621, Insert, M75, 3H, 22mm, Split w/ plugs  |                       |
| <b>HBK012</b>    | HBF012          |              | RFS Technologies-JUMP-KIT-2 | (1) 190 0903, Insert, M75, 2H, 15mm, Split w/ plugs  |                       |
| <b>FRK-N</b>     | FR-N            |              | RFS Technologies-FIBER-KIT  | (1) 190 0657, Insert, M75, 6H, 6.1mm, Split w/ plugs |                       |